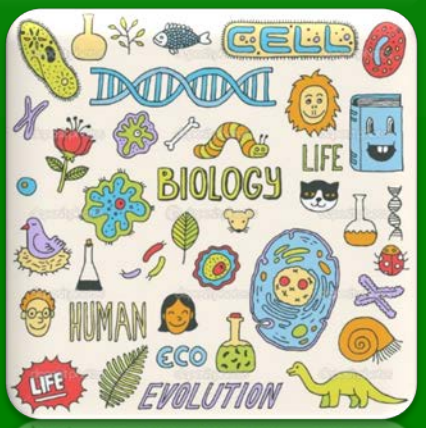
Biology



The core concepts of Biology for Class VII are as follows:

Class VII

Tissue

Kingdom Classification

Plant Life

Human Body

Theme 1: Tissue

In the previous class, children learnt about the cell, which is the basic unit of life in plants and animals. The cells are organized into tissues, organs, organ-systems and finally into an organism. The theme in this class will focus on enabling children to know about the tissues and the different types of tissues in plants and animals.

Learning Outcomes:

Children will be able to:

- define the term 'tissue';
- relate that plants and animals have different types of tissues;
- explain the differences between meristematic and permanent tissues with examples;
- classify the different types of animal tissues (epithelial, connective, muscular and nerve tissues).

Tissue		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
Plant Tissues ▸ Definition of tissue. ▸ Classification of plant tissues: Meristematic and permanent (simple and complex). ▸ Meristematic tissues: characteristics (any two), simple structure, location, function, examples. ▸ Simple permanent tissues: parenchyma, collenchyma, sclerenchyma (simple structure, location and functions of each), examples. ▸ Complex permanent tissues: xylem, phloem- function only. (Elements of xylem and phloem not to be mentioned).	▸ Explaining the different plant tissues to children - their location, structure, characteristics and functions. ▸ Encouraging children to develop charts and models. **Experiments** ▸ Keep a twig of petunia with white flowers in a beaker containing coloured water and observe the flowers after a few hours (flowers will become coloured). ▸ Ask children to observe and record what happens to the plant seedlings if the roots are removed and seedlings are kept in coloured water.	▸ PPTs and Videos on tissues. ▸ Photographs and pictures of tissues.
Animal Tissues ▸ Epithelial tissue: simple location, and function (types of epithelial tissue not to be mentioned). ▸ Connective tissue location and functions of bone, cartilage, blood, ligament, tendon. ▸ Muscular tissue: location and one function of:	**Animal Tissues** ▸ Showing diagrams of the following tissues: Epithetical, Connective, Muscular and Nervous tissue. ▸ Showing children diagram/images of the nervous system and pictures of Dendron and axon. ▸ Asking children to draw a	▸ Models and pictures of nervous system. ▸ Children's drawings.

Tissue		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
☛ *striated (voluntary or skeletal muscle),* ☛ *unstriated (involuntary/ smooth muscle),* ☛ *cardiac (specialized muscle*). ➢ Nerve tissue: parts of neuron (cell body, Dendron, axon). ***Note**: Only basic structure and basic functions of the above mentioned tissues to be done.*	diagram of nerve tissue. ➢ Discussing functions of nervous system.	

Theme 2: Kingdom Classification

This theme gives an insight into the study of the types of Kingdoms in Plants and Animals. Living organisms are divided into two kingdoms – Kingdom Plantae and Kingdom Animalia. The kingdom Plantae includes plants, while the animals are included under kingdom Animalia. This two-kingdom classification was found inadequate in the light of disputed position of organisms like bacteria and fungi. In view of the objections to the two-kingdom system of classification, a Five-Kingdom Classification was proposed in 1969. The five Kingdoms are Monera, Protista, Fungi, Plantae and Animalia.

Learning Outcomes:

Children will be able to:

- explain the purpose and advantages of classification;
- explain the basis of five - kingdom classification;
- differentiate between major groups of organisms;
- draw pictures of organisms representing each kingdom.

Kingdom Classification		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
▸ Meaning and concept of classification. ▸ Need and advantages of Classification. ▸ Characteristics of each kingdom with suitable examples: (i) Monera: bacteria - shape; (ii) Protista: *Amoeba* - basic structure; (iii) Fungi: basic structure of mould; (iv) Plantae: characteristics and examples (classification of plantae not to be discussed); (v) Animalia (a) Vertebrates. (b) Invertebrates: 9 major Phyla, Porifera, Cnidaria, Coelenterata, Platyhelminthes, nematoda, Annelida, Arthropoda, Mollusca, Echinodermata) (Two characteristics and two examples of each Phylum).	▸ Asking children to classify or group these plants and animals in their own way. ▸ Learning about different organisms belonging to each kingdom and asking them to write about examples of each kingdom. ▸ Drawing pictures of organisms belonging to each kingdom. ▸ Encouraging children to collect more information on each phylum. ▸ Assigning projects to make picture cards and writing their features on the other side.	▸ Plants and animals in their natural habitats. ▸ Photographs. ▸ PPTs and Videos. ▸ Picture cards.

Life Skill: appreciate diversity of life

Theme 3: Plant Life

The theme Plant Life aims at promoting children's understanding that all living organisms despite their great diversity in shapes and sizes, show similarity in their activities. They all need food, energy, grow, remove waste materials from their bodies, reproduce and respond to their environment. Growth, excretion, reproduction and response to stimuli are some of the basic life processes. This theme will particularly focus on enabling children to understand the two important processes in plants of Photosynthesis and Respiration, differences between the two and factors affecting them.

Learning Outcomes:

Children will be able to:

- discuss and demonstrate that leaves perform the function of photosynthesis;
- enlist the factors affecting photosynthesis;
- draw picture of stomata and chloroplast;
- identify the difference between respiration and photosynthesis and relate that respiration and photosynthesis help maintain the balance of CO2 and O2 in the atmosphere;
- reason out that the energy produced in respiration is used up by the body to perform life-sustaining activities;
- differentiate between the aerobic and anaerobic respiration;
- discuss the need for growing more and more plants.

Plant Life		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
Photosynthesis ▸ Definition, basic process, factors affecting photosynthesis: (light, carbon dioxide, water, chlorophyll), significance of photosynthesis, setup. ▸ Photosynthesis process (demonstration). **Respiration** ▸ Basic process, word equation; respiration as a process which releases energy; respiration in plants: two types (aerobic and anaerobic: basic concept, word equations for both, examples). ▸ Respiration and photosynthesis in plants, difference in both processes.	▸ Revisiting previous concepts. ▸ Building on children's previous learning. ▸ Asking children to observe the colour of leaves and also name plants that have yellow or red coloured leaves, discussing the reasons for such colours. ▸ Observation of stomata and chloroplasts present in the leaves (using images). ▸ Drawing picture of stomata and chloroplast and labelling their parts. ▸ Summarizing the process of photosynthesis with the help of a word equation (No symbols) ▸ Showing video of the hydrilla experiment to show evolution of oxygen during photosynthesis. ▸ Discussing the difference between aerobic and anaerobic respiration and citing examples of both. ▸ Discussing differences between the respiration and photosynthesis	▸ Images, PPTs, videos.

Plant Life		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
	process in plants and asking children to explain both the processes in their own words.	

Theme 4: Human Body

In the previous classes, children were exposed to basic information regarding some of the organ systems in the human body (digestive, respiratory and circulatory systems). In this theme, children will study the excretory system in the human body.

Learning Outcomes:

Children will be able to:

- define the term 'excretion' and its need/significance;
- draw the outline figure of the human body and mark the location of kidneys, skin, sweat glands and lungs;
- infer that the kidneys play an important role in excretion.

Human Body		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
Excretory System • Excretion: Definition. • Organs and their excretory products (kidneys, sweat glands, lungs); • Renal Excretory System - kidneys, ureter, urinary bladder, urethra (location and functions to be explained along with diagram).	• Building on children's previous learning. • Explaining the various parts of excretory system with the help of PPTs and videos. • Explaining the difference between excretory and waste products. • Asking children to label diagram of the excretory system. • Providing children opportunities to share their personal experiences.	• PPTs and videos. • Children's drawings.